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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/045,515	10/26/2001	Tsutomu Tanaka	A5015/T40100	2999

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APPLIED MATERIALS, INC.
2881 SCOTT BLVD. M/S 2061
SANTA CLARA, CA 95050

EXAMINER	
JONES, STEPHEN E	

ART UNIT	PAPER NUMBER
2817	

DATE MAILED: 07/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/045,515	TANAKA ET AL.	
	Examiner	Art Unit	
	Stephen E. Jones	2817	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for R ply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 May 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,9-11 and 14-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,9-11 and 14-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thomas (of record).

Thomas (Fig. 3) teaches a coaxial hybrid coupler junction including: a pair of coaxial lines (11 and 16) are spaced apart by insulation of a uniform thickness over the inductive distance (i.e. the lines are side by side in parallel) (see Col. 2, lines 24-25) (Claim 4); energy (i.e. ac power) is supplied to one of the terminals (A, B, C, D) of the lines (see Col. 2, lines 40-41); the energy divides (inherently inductively as is conventional in spaced couplers) between the opposite terminals (B and C); and the

impedance is constant along the inductive length (i.e. impedance matched along the length) (see Col. 2, lines 24-26). Thomas also teaches that the conductors (11 and 16) can be an odd multiple of a quarter wavelength (see Col. 2, lines 50-52). Also, note regarding Claim 1, since the first transmission line has a port then it can be coupled to an ac power source, and since the second transmission line has a port then it can be coupled to a load.

However, Thomas does not explicitly teach that the inductive length of the conductors (11 and 16) are at least one wavelength (Claim 1).

It would have been considered obvious to one of ordinary skill in the art to have chosen to make the odd multiple of a quarter wavelength five, especially since five is a known odd multiple and would have provided at least a wavelength and Thomas suggests odd multiples as a modification.

4. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Thomas in view of Heiter (both of record).

Thomas teaches a coupler as described above. Thomas also refers to reflectionless terminations (e.g. see Col. 2, lines 39-43). However, Thomas does not explicitly teach a trimming element coupled to the first transmission line and coupled to ground.

Heiter teaches using a resistor (e.g. 72) connected to an unused port of a coupler (e.g. 46) and coupled to ground.

It would have been considered obvious to one of ordinary skill in the art to have included a resistor element such as taught by Heiter between the unused port of the first

transmission line and ground in the Thomas structure, because it would have provided the advantageous benefit of dissipating (i.e. trimming) reflections (see Col. 3, lines 36-44 of Heiter), thereby suggesting the obviousness of such a modification.

5. Claims 2, 9-11, and 14-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barnes et al. in view of Thomas (all of record).

Barnes (Fig. 1) teaches a plasma processing system including: an RF source generator (14) connected to a directional coupler (36); the coupler is connected to a plasma processing chamber for substrates (see Col. 1, lines 26-30) (Claim 18 subject matter); and the typical source frequency is 13.56 MHz.

However, Barnes does not explicitly teach that the coupler is a matching network having two transmission lines coupled over an inductive length which is at least one wavelength (Claims 9, 14), that the first line receives the ac energy from the source and the second line receives the energy from the first line and the second line delivers the energy to the plasma (Claim 10), that the lines are parallel (Claim 11), that the inductive length is between 3000 and .12 meters (Claim 15) or between 857 and .75 meters (Claims 2, 16, and 17).

Thomas teaches an in phase quadrature coupler as described above. Thomas also teaches that energy can be applied to the first line (e.g. port A) and outputted from the second line (e.g. port B) (see Col. 2, lines 40-45)

Regarding Claims 10, 11, 18, 19, it would have been considered obvious to one of ordinary skill in the art to have substituted the quadrature hybrid coupler such as taught Thomas in place of the generic directional coupler in the Barnes et al. device,

because both directional couplers and the quadrature hybrid coupler are art recognized functionally equivalent 90 degree out of phase port coupler means, thereby suggesting the obviousness of such a substitution.

Furthermore (regarding Claims 9, 14, 17, and 19), it would have been considered obvious to one of ordinary skill in the art to have chosen to make the inductive length of the conductors to have an odd multiple of a quarter wavelength be five in the combination of Barnes and Thomas, especially since 5 is a known odd multiple and would have provided at least a wavelength and Thomas suggests odd multiples as a modification.

Also, regarding Claims 2, 15, 16, and 17, it would have been considered obvious to one of ordinary skill in the art to have the inductive length be between 3000 and .12 meters or between 857 and .75 meters, because Barnes teaches a typical frequency of 13.56 MHz and the length is related to the frequency (i.e. wavelength is equal to c/f) and with the odd multiple of 5 described in the previous paragraph the length would be within the ranges stated in the present claims.

Response to Arguments

6. Applicant's arguments filed 5/3/04 have been fully considered but they are not persuasive.

Applicant argues that the Barnes reference and Thomas conductors are not coupled for at least one wavelength and that modifying the length of the conductors in the quadrature coupler of Thomas would change the phase difference between terminals B and C.

Applicant's arguments are not convincing. As stated in the rejections Thomas teaches that the conductors couple to one another for approximately one-quarter wavelength or and odd multiple thereof, and five is an odd multiple of a quarter wavelength as Thomas suggests for the quadrature coupler (which Applicant appears to admit on page 7, last paragraph of the response dated 5/3/04), thus odd multiples of the conductive length such as five (which is at least one wavelength) would have been obvious to one of ordinary skill in the art.

Conclusion

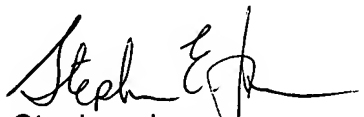
7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen E. Jones whose telephone number is 571-272-1762. The examiner can normally be reached on Monday through Friday from 8 AM to 4 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert J. Pascal can be reached on 571-272-1769. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Stephen Jones
Patent Examiner
Art Unit 2817

SEJ